

Guam Power Authority

Smart Grid Project

Abstract

The Guam Power Authority's (GPA) Smart Grid project involves a territory-wide deployment of advanced metering infrastructure (AMI) and implementation of substation automation equipment, which includes circuit switches, capacitors, voltage regulators, fault indicators, smart relays, and equipment sensors. Customers can install devices that assist in managing electricity use and costs, including in-home displays and home area networks. The new AMI and substation automation technologies are intended to improve reliability and stability of GPA's electric system, reduce operating costs, and accommodate future deployment of distributed generation.

Smart Grid Features

Communications infrastructure includes the necessary meter communications and backhaul networks to enable two-way communication between the smart meters, substation automation assets, and the head end system.

Advanced metering infrastructure includes the territory-wide deployment of more than 50,000 smart meters to both commercial and residential customers. The meters provide customers with home area network connectivity, allowing customers to install additional energy management tools such as energy management systems. The smart meters also reduce meter operations costs and electricity theft. Furthermore, GPA is integrating the AMI system with an outage management system (OMS), which includes a fully detailed circuit model integrated with supervisory control and data acquisition, meter data management system, enterprise planning system, and customer information system. GPA expects the integration of AMI and OMS to enable faster outage identification and restoration, real-time calculation of outage indices, and more efficient dispatch of field resources.

Advanced electricity service options include a Web portal that enables customers to view their electricity usage and costs so that they can better manage their consumption and bills. Pre-paid metering will also be available to customers and can be integrated with the Web portal.

At-A-Glance

Recipient: Guam Power Authority

Territory: Guam

NERC Region: N/A

Total Budget: \$33,207,014

Federal Share: \$16,603,507

Project Type: Advanced Metering Infrastructure and
Customer Systems Electric Distribution
Systems

Equipment

- 50,280 Smart Meters
- AMI Communication Systems
 - Meter Communications Network
 - Backhaul Communications
- Customer Web Portal
- Substation Automation Equipment for 7 out of 29 Substations
 - Substation Automation Communications Network
 - Digital relays
 - Transformer Monitors

Key Targeted Benefits

- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Improved Electric Service Reliability and Power Quality
- Reduced Costs from Equipment Failures, Distribution Line Losses, and Theft
- Reduced Truck Fleet Fuel Usage
- Reduced Greenhouse Gas and Criteria Pollutant Emissions

Guam Power Authority *(continued)*

An energy management system is being deployed to better utilize the automation assets and improve distribution system reliability and operational efficiency. In addition, an outage management system integrated with the AMI and distribution management system enables GPA to identify and respond to outages in less time.

Substation automation systems include the installation of smart relays, and equipment health sensors (transformer monitors). This system enables advanced transmission and distribution activities and information exchange, through data acquisition from the power grid. It also includes an upgrade of system protection practices, as well as substation metering to better account for system losses and remotely read revenue meters with power quality functions.

Timeline

Key Milestones	Target Dates
AMI asset deployment begins	Q3 2012
Substation automation asset deployment begins	Q2 2013
AMI asset deployment ends	Q1 2014
Substation automation asset deployment ends	Q4 2013

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